Remarks/Arguments:

Claims 1-10 are pending in the above-identified application.

Claims 1, 2, 5 and 7-9 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hattori et al. and Yanai et al. This ground for rejection is overcome by the amendments to claim 1. In particular, neither Hattori et al., Yanai et al. nor their combination disclose or suggest that "the variable attracting current increases progressively to a peak value in the course of the approach of the plate to the electromagnet, and the variable attracting current is immediately decreased after the peak value is achieved." Basis for this amendment may be found in paragraph [0045] and Fig. 3b. As shown in Fig. 3b, the current i_b, with which the upper electromagnet is supplied, exhibits a peak corresponding to the plate approaching the upper electromagnet. The current then immediately decreases from this peak value. This operation is neither disclosed nor suggested by either Hattori et al., Yanai et al. or their combination.

Hattori et al. describe an electromagnetic actuating system for actuating a valve member. The electromagnetic actuating system includes an armature that moves with the valve member, an electromagnet that attracts the armature when supplied with current, and a spring that presses the armature away from the electromagnet. A permanent magnet exerts magnetic attracting force between the armature and the electromagnet. A current controller supplies a release current to the electromagnet so that magnetic flux is generated in a direction opposite to the direction of the magnetic flux generated by the permanent magnet to release the armature from the electromagnet. As shown in Fig. 5B, in Hattori, the current does not increase progressively to a peak value and then is immediately decreased from the peak. Instead, Hattori et al. disclose in Fig. 5B that the current rises quickly to the peak value and holds this value until the valve is fully opened. Only then does the current decrease.

Yanai et al. describe a valve driving apparatus that uses an electromagnetic coil to move a valve body to close a valve coupled to the valve body with reduced noise. In Yanai, a current supplied to the electromagnetic coil is controlled to generate an electromagnetic force that drives the valve body. The current supplied to the electromagnetic coil is controlled such that it decreases when the valve body approaches the end of a stroke to reduce the shock and, in turn, the noise generated when the valve closes at the end of the stroke. In Yanai et al., however,

this decrease does not occur immediately after the current reaches its peak value. As shown in Fig. 4, the designated current reaches a peak value and holds that peak value until just before the valve is switched. Thus, Yanai et al. do not disclose or suggest this limitation of amended claim 1. This feature of the invention provides the advantage of reducing the power consumption of the valve. Because the current is decreased immediately after the peak value is achieved, less current is applied to the electromagnets of the subject invention than is applied by either Hattori et al. or Yanai et al. Accordingly, claim 1 is not subject to rejection under 35 U.S.C. § 103(a) in view of Hattori et al. and Yanai et al.

Claims 2, 5 and 7-9 depend from claim 1 and, so, are not subject to rejection under 35 U.S.C. § 103(a) in view of Hattori et al. and Yanai et al. for at least the same reasons as claim 1.

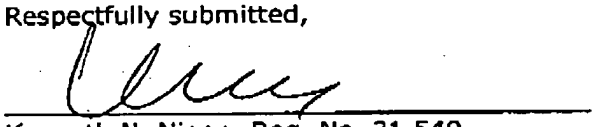
Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Hattori et al., Yanai et al., and Curtis et al. This ground for rejection is overcome by the amendments to claim 1, from which claims 3 and 4 depend, for the reasons set forth above. Hattori et al. and Yanai et al. are described above. Curtis et al. concerns a electromagnetic valve actuator which, as shown in Fig. 5, applies a current which reaches a peak value and holds the current at the peak value before decreasing the current as required by amended claim 1. Thus, Curtis et al. do not provide the material that is missing from Hattori et al. and Yanai et al. Accordingly, claim 1 and claims 3 and 4 which depend from it are not subject to rejection under 35 U.S.C. § 103(a) in view of Hattori et al., Yanai et al., and Curtis et al.

Claim 6 was rejected under 35 U.S.C. § 103(a) as being obvious in view of Hattori et al., Yanai et al. and Kawamura. This ground for rejection is overcome by the amendments to claim 1, from which claim 6 depends, for the reasons set forth above. Hattori et al. and Yanai et al. are described above. Kawamura concerns a electromagnetic valve actuator. Kawamura does not describe the profile of the current that is applied to the electromagnet. Accordingly, Kawamura can not provide the material that is missing from Hattori et al. and Yanai et al. Accordingly, claim 1 and claim 6 which depends from it are not subject to rejection under 35 U.S.C. § 103(a) in view of Hattori et al., Yanai et al., and Kawamura.

As no specific rejection of claim 10 was made, Applicants assume that claim 10 is objected to as being dependent from a rejected base claim. Accordingly, claim 10 is amended to include the limitations of its base claim 1 and is now in condition for allowance.

In view of the foregoing amendments and remarks, Applicants request that the Examiner reconsider and withdraw the rejection of claims 1-9 and the objection to claim 10.

Respectfully submitted,



Kenneth N. Nigon, Reg. No. 31,549
Attorney for Applicants

Dated: August 16, 2005

P.O. Box 980
Valley Forge, PA 19482
(610) 407-0700

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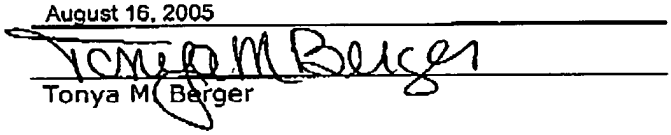

Tonya M. Berger

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